



'A tale of two Covids' –South Africa and the UK

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Summary

This article provides a comparative overview of the COVID-19 epidemics in United Kingdom and South Africa. It touches on how the epidemic started, initial government reactions, some differences in demography, the dire economic situation in South Africa and the tough choices both governments will have to make in the near future.

Introduction

The aim of the article is to profile the differences and similarities between the COVID-19 epidemics in the United Kingdom and in South Africa (SA), including:

- A month's delay in the start for SA compared with the UK.
- Evidence that SA may have bought some time and saved significant lives by responding relatively sooner than the UK to the pandemic.
- Implications of the younger population, which could mean that SA will experience lower deaths than the UK, though this ignores other health issues in South Africa. The converse of this is that SA will see relatively more years of life lost per death.
- SA's economic situation and how the economy was already struggling before the pandemic
- The tough choices needed to be made in both countries on the road ahead.

The aim of this article is not to second-guess the difficult policy decisions that have been made in SA and the UK, but merely to highlight some key similarities and differences in how COVID-19 is affecting the two countries.

Timeline of the pandemic in the UK and SA

From the timeline below it can be seen that the first cases were reported in the two countries roughly a month apart. The first confirmed cases occurred in UK at the end of January 2020 whereas in SA the first confirmed cases were reported on 5 March and entered SA on 1 March.

What is striking about the timeline is that both governments started with meaningful interventions at the same time from mid-March 2020. Both governments announced lockdowns within a day of each other (23 March for the UK, 24 March for SA). The UK's lockdown started 24 March whereas SA's started effectively on 27 March.

The UK took a month longer than SA to mount serious suppression interventions and the differences this makes on 1 May seem clear. As of 1 May SA had just exceeded 103 deaths compared with the UK's 26 771 deaths^[1]. SA's later seeding of infections and much earlier intervention has, so far, saved many lives. The difference in outcome is startling. The UK has still not implemented travel restrictions.

The UK also has significantly more confirmed cases than SA, but we do need to consider testing rates to get a sense of whether the case counts are comparable. Testing data shows that SA has tested 3.7 people per 1,000 whereas the UK has tested approximately 11.2^[2]. It's clear that SA is testing less than UK, but not necessarily to a degree that it would be undercounting significantly the case load in SA.

It should be noted that testing protocols vary between these countries, over time and probably also regionally inside these countries. Also note that for this epidemic the reported cases generally are not the same as the actual infections prevalent in the population. Due to larger numbers of mild cases and asymptomatic cases, as well as testing limitations, many in both countries may never be tested.

The timeline below sets out a comparison of the major events relating to the epidemic in the two countries:

	United Kingdom	South Africa
31 January	First confirmed cases	
28 February	First death due to COVID-19 announced	
5 March		The first COVID-19 case announced in South Africa
15 March		State of Disaster Declared including announcement of school closures as well as closure of borders
16 March	Advisory against non-essential travel	
18 March	School closures announced	Schools and other educational institutions close
20 March	Requests for closure of pubs, gyms, entertainment venues etc.	
23 March	Lockdown announced	
24 March	Lockdown starts	21-day lockdown announced.
27 March		First day of lockdown First deaths due to COVID-19 announced.
5 April	The Queen addresses the nation and Boris Johnson is admitted to hospital for COVID-19	
9 April		Extension of lockdown to 30 April announced
12 April	UK exceeds 10 000 deaths	
21 April		Announcement of further economic and social measures in response to the COVID-19 epidemic
23 April		Announcement of lockdown exit strategy involving 5 levels of lockdown that may vary by province or smaller districts.
27 April		South Africa celebrates Freedom Day in lockdown
29 April	UK deaths adjusted to include deaths in community. Total exceeds 26 000.	
1 May		Workers Day Commencement of level 4 lockdown nationwide – Slight relaxation of lockdown rules
1 May	172 000 cases reported 26 771 deaths	5 647 cases reported 103 deaths

Projections

Below we tabulate model projections from Imperial College Report 12 ^[3]. The scenarios tabulated are from the above report and can be described briefly as:

- *Unmitigated* – A scenario where no interventions are made to stop the epidemic.
- *Mitigation 1* – A scenario where contacts (and hence transmission) are reduced between 40% and 50%.
- *Mitigation 2* – As per Mitigation 1 but also the elderly (over 70) are sheltered so that their contacts are reduced by 60%
- *Suppression Late* – Suppression of 75% of contacts relatively late
- *Suppression Early* – Suppression of 75% of contacts relatively early in the epidemic.

In all cases we use the output shown corresponds to R_0 of 3.

United Kingdom	Unmitigated	Mitigation		Suppression	
		1	2	Late	Early
Population	67 886 004	67 886 004	67 886 004	67 886 004	67 886 004
Infections	58 995 235	38 851 158	37 944 291	19 009 388	3 805 866
Deaths	591 887	301 239	238 949	120 735	21 825
Hospitalised	2 647 865	1 485 668	1 313 637	640 236	117 324
Critical Care	784 928	399 341	316 815	254 138	34 153
Infection Ratio	87%	57%	56%	28%	6%
Infection Fatality Ratio	1.0%	0.8%	0.6%	0.6%	0.6%

South Africa	Unmitigated	Mitigation		Suppression	
		1	2	Late	Early
Population	59 308 690	59 308 690	59 308 690	59 308 690	59 308 690
Infections	52 669 882	35 977 239	35 976 825	22 629 957	3 961 213
Deaths	216 064	145 536	125 010	90 469	15 438
Hospitalised	1 398 489	973 006	914 191	613 931	106 575
Critical Care	286 429	192 965	165 794	260 261	30 600
Infection Ratio	89%	61%	61%	38%	7%
Infection Fatality Ratio	0.4%	0.4%	0.3%	0.4%	0.4%

From the above we see that using the assumptions per Imperial College Report 12 the burden of the disease is somewhat less in SA. SA has a much younger population age profile. Since the mortality and hospitalisation figures for the disease are strongly correlated with age, it may be expected that SA would have lower hospitalisation rates and a lower overall infection fatality ratio.

From the modelling we note that sheltering the elderly has less impact in South Africa. It is more difficult to do this in South Africa, due to multigenerational households and higher contact rates of the elderly compared with the UK as assumed in the model.

In the above modelling, the same infection fatality ratios for SA and UK have been applied, which is probably not right. SA has far more prevalent underlying conditions such as TB and HIV/AIDS that may influence overall fatality experience. This could either be as a co-morbidity to COVID-19 or the impact of the health system overload causing worse mortality outcomes for these diseases ^[4]. It should also be noted that the fatality rates do not take account of that in the unmitigated and mitigated scenarios,

health system capacity in both countries are likely to be exceeded. I.e. deaths will increase over and above what is shown if the health system capacity is exceeded.

Years of Life Lost

Expected years of life lost was calculated using infection fatality rates and infection attack ratios by age from Imperial Report 12 and applying them to the population age breakdown and mortality figures of each country ^[5].

The average age at death is estimated to be roughly 68 in the UK and 60 in South Africa. The expected years of life lost was calculated to be 13.0 in the UK and 18.5 years in South Africa.

This shows that, despite the lower numbers of death in South Africa, there is a greater number of years lost per death occurring in South Africa. This is due to the younger age structure of the SA population. SA should thus, in theory, be willing to spend more to save a life.

The calculation here assumes average health for those that are dying. We do know that some co-morbidities play a role so these figures may be slightly different. These figures are consistently calculated between the countries and thus it remains useful as a comparison.

Economy

The South African economy had been struggling before the pandemic hit. SA has a high unemployment rate. It was estimated at 29.1% in Q3 2019 ^[6]. Also, in January 2020 the World Bank downgraded SA's economic growth forecast from 1.5% to 0.9%. The World Bank blamed various factors, including the rolling power cuts ("load shedding") that were expected to continue, for the slow growth. On top of that the state-owned power company Eskom is in a dire financial position which affects the country's debt ^[7]. Many expect the return of rolling power cuts as the economy is reactivated.

After the start of the pandemic and the lockdown, SA was further downgraded by Moody's on 27 March and S&P on 29 April reflecting the increased pressure on the economy.

In April, the World Bank further pointed out risks to the informal sector in Sub-Saharan countries. These people lack benefits, health insurance, paid leave and many of the safety net features present in the UK ^[8].

It is clear that SA has a very difficult decisions to make as the disease, the economic consequences of the disease, and the efforts to stop the disease could be extreme. Thus, compared to the UK, SA's room to manoeuvre is much more limited and constrained in many ways. These decisions will impact both the already unemployed and SA's informal economy disproportionately.

A further problem for SA is that the economic impact has become very apparent, whilst the pandemic impact is as yet hardly felt. This paradox, referred to as a type of prevention paradox^[9], is challenging to deal with. For many, it feels like there has been an overreaction.

For comparison the UK unemployment rate for three months ending February 2020 was estimated at 4%^[10]. Though there is significant uncertainty around BREXIT and its potential impact on the UK economy, the UK's economic outlook is somewhat rosier than SA's before the epidemic.

Exit Strategies

On 1 May SA started the first tentative steps to lift lockdown slowly and in a stepwise manner. SA announced a 5-level system with level 5 being the full strict lockdown experienced since 27 March. Level 4 is now in place nationwide which allows some low risk industries (such as financial services) to return to work and also opens up some personal freedoms (such as allowing exercise). Many of the regulations are somewhat poorly explained, such as exercise is only allowed between 6am and 9am leading to the inevitable crowding along popular running and walking routes in cities. Level 4 also continues to contain a ban on the sale of cigarettes and alcohol even for home consumption ^[11] which is affecting the collection of taxes on these items and may be stimulating illegal cigarette sales

SA's exit strategy has a framework for data-driven decision-making around what parameters should be considered for moving between levels based on health system capacity. There is also a strong emphasis on testing and screening. For example, all employers will be required to screen employees on a daily basis as they arrive for work and send anyone with symptoms for further testing and not allow them entry into the workplace.

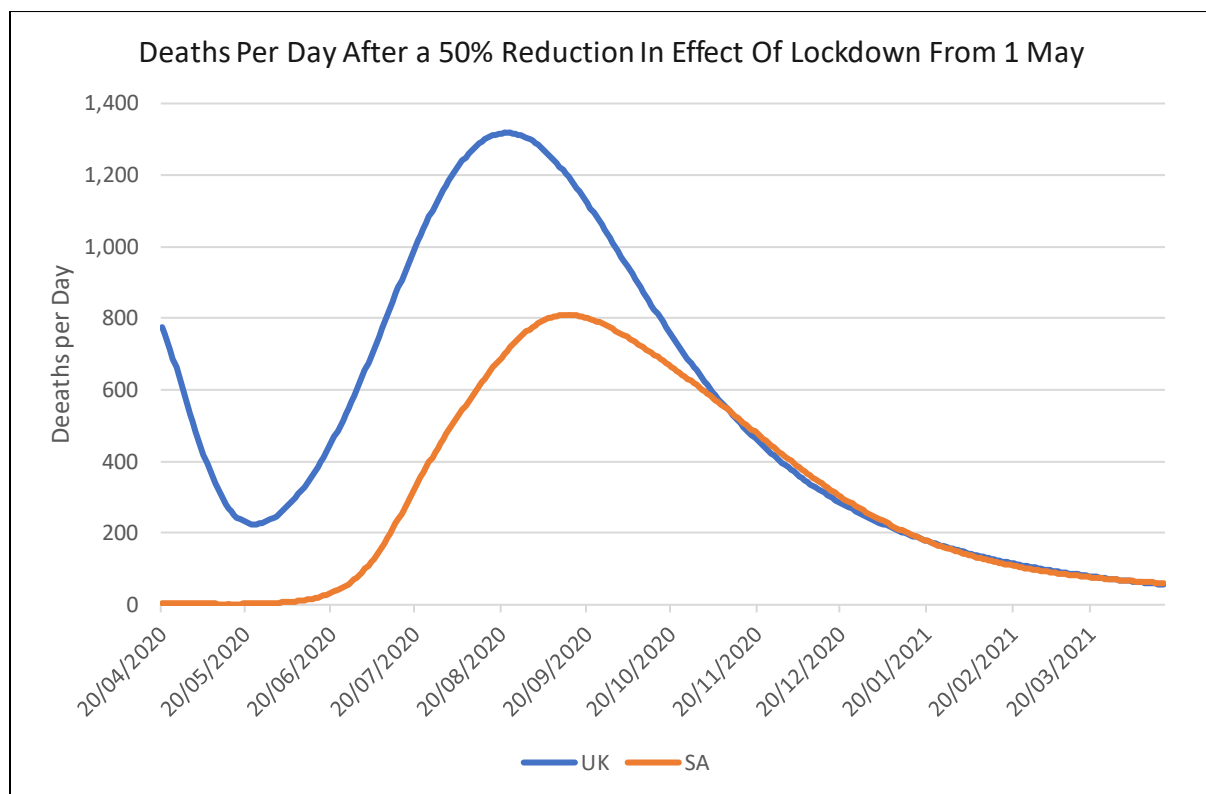
The plan is to also implement provincial and district variation of these levels should the need arise, allowing different provinces or districts to be at different alert levels.

At the time of drafting, the UK was about to publish their comprehensive plan, expected to contain five tests revolving around NHS capacity, a sustained fall in deaths, a falling infection rate, addressing testing and PPE, and that a second peak should not overwhelm the NHS ^[12].

Impact of a rapid lifting of lockdown

Imperial College Report 13 contains analysis of the impact of interventions on the R_t , the effective infectivity rate of the disease over time, and shows how the lockdowns have helped in 11 European countries ^[13]. The code for this report was adapted and SA included. A lockdown at 50% the effectiveness of the current lockdown was modelled in both UK and SA from 1 May onwards.

According to the adapted model this would result in both countries reaching new peaks in daily deaths. For the UK this would be peak at the end of August or start of September at in excess of 1,200 deaths per day. For SA this peak would be further into September at ~800 deaths per day. There are obviously very wide confidence intervals on these projections, however, it should be clear that lifting the lockdown too quickly could undo the work both countries have done in reducing future potential peaks of the epidemic.



Conclusion

It would seem that UK and SA have some significant similarities in their approaches. They both started acting in mid-March, albeit the UK was later relative to their epidemic. SA's early intervention probably saved a significant number of lives. This is clear in the comparison with UK figures to date.

It is clear that SA does not have as much economic leeway as the UK to maintain a long and strict lockdown; also, the lack of evidence of a severe pandemic in the country may make the economic impact of lockdown difficult to support. Though not addressed above, SA also doesn't have the health capacity of the UK.

It would also seem that, with any poorly executed lifting of its lockdown, all SA's good work could be lost, bringing the country to a similar situation as that seen in the UK thus far and perhaps worse. The same applies to the UK's exit strategy. The current plans (as revealed thus far) do seem generally sensible, though far from perfect and sometimes not well explained in the case of SA. The hope is that SA and the UK can safely navigate opening their economies, while maintaining a lid on the epidemic. This remains as a difficult challenge especially with SA's constraints.

It should also be noted that there are many countries with poorer economies than SA and these countries may face even tougher choices.

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